

What we claim is:

1. The process for manufacturing vinyl acetate in a fluid bed reactor comprising feeding ethylene and acetic acid into the fluid bed reactor through one or more inlets, feeding an oxygen-containing gas into the fluid bed reactor through at least one further inlet, co-joining the oxygen-containing gas, ethylene and acetic acid in the fluid bed reactor while in contact with a fluid bed catalyst material to enable the ethylene, acetic acid and oxygen to react to produce vinyl acetate and recovering the vinyl acetate from the fluid bed reactor.

2. The process of claim 1 wherein the ethylene and acetic acid are fed into the reactor as a gaseous mixture through the one or more inlets.

3. The process of claim 2 wherein the ethylene and acetic acid gaseous mixture contains oxygen below its flammability limit in the mixture.

4. The process of claim 1 wherein the fluid bed catalyst has the following formula: Pd-M-A wherein M comprises Ba, Au, Cd, Bi, Cu, Mn, Fe, Co, Ce, U and mixtures thereof and A comprises an alkali metal or mixture thereof.

5. The process of claim 4 comprising maintaining the amount of fluid bed catalyst material in said reactor at a volume sufficient to allow for the dissipation of heat generated during the reaction of the ethylene, acetic acid and oxygen-containing gas thereby enabling said reaction to proceed without damage to the fluid bed catalyst.

6. The process of claim 5 wherein said fluid bed catalyst material comprises a mixture of particulate catalytic material and particulate inert material.

7. The process of claim 6 wherein 60% of the particulate fluid bed catalytic material has a particle size diameter of below 200 microns and no more than 40% of the catalyst particles have a diameter less than 40 microns.

8. The process of claim 1 wherein the ratio of the sum of the ethylene, acetic acid to oxygen-containing gas entering is within the flammability limits for said mixture.

5 9. The process of claim 8 wherein the concentration of the ethylene in the combined gaseous feeds entering the reactor is between 30 to 70 volume percent.

10 10. The process of claim 9 wherein the concentration of the gaseous acetic acid in the combined gaseous feeds entering the reactor is between 10 to 25 volume percent.

11. The process of claim 10 wherein the concentration of the oxygen in the combined gaseous feeds entering the reactor is between 8 to 25 volume percent.

12. The process of claim 1 further comprising recycling at least a portion of the unreacted acetic acid, ethylene and oxygen into the fluid bed reactor.

13. The process of claim 12 further comprising recovering at least a portion of the fluid bed catalyst material escaping the fluid bed reactor and recycling said material into the fluid bed reactor.

20 14. The process of claim 1 wherein the pressure ranges from about 50 to 200 psig.

15. The process of claim 14 wherein the temperature ranges from between about 100°C to 250°C.